I. INTRODUCTION

ISO-New England ("ISO") supports the request of New England Power ("NEP") for a zoning exemption under M.G.L. c. 40A§3 for NEP's proposed transmission project for North Shore reliability at Ward Hill (hereinafter referred to as the "Transmission Project" or the "Ward Hill Transmission Project") that is the subject of docket D.T.E. 04-66. The reason is simple. As described on the record and throughout this Brief, there is a compelling and current need for the prompt grant of the necessary approvals and the commencement of construction of NEP's proposed transmission facilities. The evidence in this case clearly shows the need for the Transmission Project.

It is important that the Ward Hill Transmission Project move forward expeditiously to ensure continued reliable electric service to the North Shore and beyond. Specifically, without the Ward Hill upgrades, under stressed circumstances transmission facilities could fail, thereby causing service outages, due to overloaded transmission facilities and low voltages. The relevant engineering analysis describes such situation as follows:

The NEMA/Boston Planning Study analyzed the thermal and voltage performance of the North Shore area. This study discovered that, for stressed system conditions (including high New England North-to-South and high BOSTON Import transfers), the existing Ward Hill 345-115 kV transformer and area 115 kV facilities are subject to post contingency overloads. Additionally, without Salem Harbor generation, voltages do not meet criteria for a significant number of contingencies—.

Exh. NEP-JWM-6, pp. 18. and 19. (RTEP04 Study, p. 260).

Also, the need for the proposed Transmission Facilities exists because of an insufficient operating reserve in the North Shore area:

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¹ ISO has not intervened in the consolidated D.T.E. 04-81 addressing the associated distribution level work, but is generally supportive of actions taken to ensure reliable delivery of electric service at any level.

The North Shore area does not have a sufficient combination of transmission and generating capacity to meet reliability and operating reserve requirements with the existing generation resources in this area. The ability to meet these standards is further aggravated if existing generation is unavailable.

Exh. NEP-JWM-6, pp. <u>48 and 19</u>. (RTEP04 Study, p. 261).

A. ISO-New England's Interests

1. Scope of ISO's Brief

ISO files this Brief in accordance with the established procedural schedule. ISO's Brief, like its participation in the proceeding, seeks to aid the process by focusing on the issues it can uniquely address – the current and projected condition of the adequacy of the transmission system in the relevant local and regional area, including the capability to import generation to the area, the adequacy of local generation resources, the associated issues of need (and the timing of such need) for the proposed Transmission Project, and the nature and status of ISO's review and approval of the Transmission Project from a regional bulk power perspective. Therefore, ISO, for the most part, will neither address environmental issues, nor will it seek to chronicle the full range of filings made throughout the proceeding.

2. ISO's Responsibilities

ISO's role is to operate New England's bulk electric power system, administer the wholesale electricity market, provide financial settlements for the region's Open Access Transmission Tariff, and manage a comprehensive, regional, system planning process. In this role, ISO independently operates and maintains a highly reliable bulk transmission system, promotes efficient wholesale electricity markets, and works collaboratively and proactively with state and federal regulators, NEPOOL Participants, and other

stakeholders. ISO was established as the Independent System Operator of the New England bulk power grid on July 1, 1997,² to undertake certain operating and transmission reservation responsibilities previously held by NEPOOL, which transferred its staff and assets to ISO. In June, 2001, and June 2003, FERC conferred authority on ISO to be responsible for the regional transmission planning process.³

Pursuant to its responsibility for conducting long-term system planning for the New England region, ISO conducts and directs the studies that compromise the regional transmission expansion plan ("RTEP"). The RTEP is developed through an open process and through participation of, and review by, interested parties, including NEPOOL Participants and other stakeholders (such as transmission and generation owners, marketers, governmental representatives, state agencies (including those participating in the New England Conference of Public Utilities Commissioners), representatives of local communities, and consultants). This group is the Transmission Expansion Advisory Committee ("TEAC"). The TEAC meets regularly throughout the year and its meetings are open to any interested party. This regional plan is updated annually. *See generally* Exh. NEP-JWM-6.

Each RTEP summarizes results from a yearlong regional planning effort that examines system needs throughout New England. The RTEP is a comprehensive, electrical engineering assessment comprised of numerous studies and analyses of New

² New England Power Pool, Order Conditionally Authorizing Establishment of an Independent System Operator and Disposition of Control Over Jurisdictional Facilities, 79 FERC ¶ 61,374 (1997) (authorizing formation of ISO).

³ ISO New England Inc. & New England Power Pool, Order On Rehearing Requests and Compliance Filings, 95 FERC ¶ 61384 (2001)(authorizing ISO to oversee regional transmission planning); New England Power Pool & ISO New England Inc., 103 FERC ¶ 61,304 (2003) (accepting October 2001 compliance filing as to the directive regarding Sections 18.4 and 18.5 of the Restated NEPOOL Agreement, and stating that "[w]e are persuaded by ISO-NE's arguments that it is the appropriate authority to approve planning for transmission upgrades and changes to supply and demand-side resources.").

England's bulk electric power system. By identifying problem areas and discussing those needs through regular meetings with the TEAC, the RTEP is intended to provide appropriate information to the wholesale electricity marketplace on power system needs that may be addressed through market solutions. Market responses might include investment in generation, merchant transmission facilities, and demand response programs. If the market does not respond with adequate solutions to the defined system needs, ISO is charged with providing a coordinated transmission plan that identifies appropriate transmission upgrades based on reliability and economic considerations. The plan is implemented only after market solutions have been considered. Thus, the RTEP is a planning process that responds to and integrates market responses with needed transmission upgrades in order to achieve a reliable system that balances generation, demand response, and transmission.

This rigorous RTEP process concluded that the Transmission Project is needed for continued reliable service. There are several reasons for concern about reliability on the North Shore arising now. RTEP04 describes them as follows:

The North Shore section of the Boston Import Area is served from Ward Hill, Tewskbury (115 kV), and Golden Hills. The primary source of generation in the North Shore area is the Salem Harbor plant. The North Shore area presently has limited transmission import capability, and some level of local generation is required to be available and operating. Historically, this relatively small geographical load area was not typically subjected to resource adequacy or operating reserve analyses. The area was planned and could be operated reliably, consistent with NPCC and NEPOOL criteria. However, three factors have led to reliability concerns in this area: 1) increasing transfers across the North-South interface; 2) increased transfers across the Boston Import interface; and 3) local load growth within the North Shore area.

The transmission import capabilities (into the Boston Import and North Shore areas) and New England's North-South interface capabilities are codependent. Boston Imports and North-South transfers increase the loading on the North Shore transmission facilities by producing a power flow across North Shore

interface facilities. This through-flow reduces the North Shore's ability to import power.

Exh. NEP-JWM-6, p. 17 (RTEP04, p. 259).

As discussed below, the RTEP process concludes that the Ward Hill upgrades are the proper solution for such problems.

B. New England Power's Proposed Transmission Project And Its Effect on Reliability

NEP's witness described the Transmission Project as follows:

To install three additional $345-115~\rm kV$ transformers at the existing Ward Hill substation, expanding the $345~\rm kV$ switching and reterminating the $394~\rm line$ into two independent switch positions, one from Tewksbury and one from Seabrook. Rearrangement of the $115~\rm kV$ switchyard is also required to terminate the new transformers.

Exh. NEP-JWM, p. 6 of 8.

The Transmission Project, along with several other contemplated projects that are not the subject of these dockets,⁴ is designed to ensure compliance with industry standards (*see* Section IV.C.1 below), to ensure reliability of service on the North Shore (*see* Section IV.C.2 below) and to increase the import capability and operating reserve (*see* Section IV.C.3 below) of the North Shore. Exh NEP-JWM, p. 5, NEP-JWM-6, p. 18 (RTEP04, p. 260).

The Transmission Project has been reviewed by TEAC and included in RTEP'04 as a recommended transmission system upgrade. The ISO-NE finalized the RTEP04 in October 2004. *Id*.

RTEP04 identified several other transmission projects that should be done to ensure North Shore reliability over the longer term. Those projects include work at Wakefield Junction and Golden Hills. Exh.NEP-JWM-6, p. 22 (RTEP04, pp. 262, 264).

II. SUMMARY OF ISO'S POSITION

ISO strongly supports NEP's Transmission Project, as proposed and urges the Department to grant the requested zoning exemption expeditiously. As reported in RTEP04, under stressed circumstances, the North Shore electric system could suffer service threatening voltage problems in 2006 – the earliest possible date for implementation of the upgrades. Also, with respect to operating reserve in similar situations, the North Shore Area is "currently deficient [and] the unavailability of any of the Salem Harbor 1 - 4 units would result in even greater deficiencies in the North Shore." Exh. NEP-JWM-6, p. 18 (RTEP04, p. 260).

This situation is exacerbated by growing load on the North Shore and increasing load flow through the North Shore to Boston. [----] Id. at 17.

Finally, the record shows that alternatives to the Transmission Project have been considered, but are either more expensive, or are not as good a solution. (Id at 1. and 24)Exh. NEP-JWM-4, pp. 20-24; Exh. NEP-JWM-6, p. 22 (RTEP04, p. 264).

III. STANDARD OF REVIEW

This case and the Department's grant of a zoning exemption is governed by M.G.L. c. 40A, § 3, which provides, in relevant part, that

Land or structures used, or to be used by a public service corporation may be exempted in particular respects from the operation of a zoning ordinance or bylaw if, upon petition of the corporation, the [Department] shall, after notice given pursuant to section eleven and public hearing in the town or city, determine the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public

<u>US GEN New England, Inc.</u>, D.T.E. 03-83 p. 3 (2004) ("<u>USGenNE</u>").

Thus, a petitioner seeking exemption from a local zoning bylaw under G.L. c. 40A, § 3 must meet three criteria. First, the petitioner must qualify as a public service corporation. Save the Bay, Inc. v. Department of Public Utilities, 366 Mass. 667 (1975) ("Save the Bay"). Second, the petitioner must establish that it requires a zoning exemption(s). Boston Gas Company, D.T.E. 00-24, at 3 (2001) ("Boston Gas"). Finally, the petitioner must demonstrate that its present or proposed use of the land or structure is reasonably necessary for the public convenience or welfare. Tennessee Gas Pipeline

Company, D.T.E. 01-57, at 3-4 (2002) ("Tennessee Gas (2002)"). Massachusetts Electric Company, D.T.E. 01-77 (2002) ("MECO 2002"); US Gen NE, D.T.E. 03-83 (2004).

A. Public Service Corporation

In determining whether a petitioner qualifies as a "public service corporation" for the purposes of G.L. c. 40A, § 3, the Supreme Judicial Court has stated:

among the pertinent considerations are whether the corporation is organized pursuant to an appropriate franchise from the State to provide for a necessity or convenience to the general public which could not be furnished through the ordinary channels of private business; whether the corporation is subject to the requisite degree of governmental control and regulation; and the nature of the public benefit to be derived from the service provided.

Save the Bay, 366 Mass. 667, 680. *See also*, <u>Boston Gas</u>, D.T.E. 00-24, at 3-4; <u>Berkshire Power Development, Inc.</u>, D.P.U. 96-104, at 26-36 (1997) ("<u>Berkshire Power</u>").

B. Exemptions Required

In determining whether exemption from a particular provision of a zoning bylaw is "required" for purposes of G.L. c. 40A, § 3, the Department looks to whether the exemption is necessary to allow construction or operation of the petitioner's project as proposed. *See*, MECO 2002, D.T.E. 01-77, at 4-5; Tennessee Gas (20092), D.T.E. 01-57, at 5; Western Massachusetts Electric Company, D.P.U./D.T.E. 99-35, at 4, 6-8 (1999)("WMECo"); Tennessee Gas Company, D.P.U. 92-261, at 20-21 (1993). The petitioner must identify the individual zoning provisions applicable to the project and then establish on the record that exemption from each of those provisions is required:

The Company is both in a better position to identify its needs, and has the responsibility to fully plead its own case . . . The Department fully expects that, henceforth, all public service corporations seeking exemptions under c. 40A, § 3 will identify fully and in a timely manner all exemptions that are necessary for the corporation to proceed with its proposed activities, so that the Department is provided ample opportunity to investigate the need for the requested exemptions.

New York Cellular Geographic Service Area, Inc., D.P.U. 94-44, at 18 (1995).

C. Public Convenience or Welfare

In determining whether a present or proposed use is reasonably necessary for the public convenience or welfare, the Department must balance the interests of the general public against the local interest. Save the Bay, 366 Mass. 667, 680; Town of Truro v. Department of Public Utilities, 365 Mass. 407 (1974). Specifically, the Department is empowered and required to undertake "a broad and balanced consideration of all aspects of the general public interest and welfare and not merely [make an] examination of the local and individual interests which might be affected." New York Central Railroad v. Department of Public Utilities, 347 Mass. 586, 592 (1964) ("New York Central Railroad").

When reviewing a petition for a zoning exemption under G.L. c. 40A, § 3, the Department is empowered and required to consider the public effects of the requested exemption in the state as a whole and upon the territory served by the petitioner. Save the Bay, 366 Mass. 667, 685; New York Central Railroad, 347 Mass. 586, 592. With respect to the project site chosen by a petitioner, G.L. c. 40A, § 3 does not require a demonstration that the petitioner's preferred site is the best possible alternative, nor does the statute require the Department to consider and reject every possible alternative site presented. Rather, the availability of alternative sites, the efforts necessary to secure them, and the relative advantages and disadvantages of those sites are matters of fact bearing solely upon the main issue of whether the preferred site is reasonably necessary for the convenience or welfare of the public. Martarano v. Department of Public Utilities, 401 Mass. 257, 265 (1987); New York Central Railroad, 347 Mass. 586, 591. Therefore,

when making a determination as to whether a petitioner's present or proposed use is reasonably necessary for the public convenience or welfare, the Department examines: (1) the present or proposed use and any alternatives or alternative sites identified; (2) the need for, or public benefits of, the present or proposed use; and (3) the environmental impacts or any other impacts of the present or proposed use. The Department then balances the interests of the general public against the local interest, and determines whether the present or proposed use of the land or structures is reasonably necessary for the convenience or welfare of the public. Boston Gas, D.T.E. 00-24, at 4-6; MECO(2002), D.T.E. 01-77 at 5-6, WMECo, D.P.U./D.T.E. 99-35, at 5-6; Tennessee Gas (2002), D.T.E. 99-5001-57, at 5-6; Tennessee Gas Company, D.T.E. 98-33, at 4-5 (1998).

IV. NEW ENGLAND POWER HAS SATISFIED THE REQUIREMENTS FOR A ZONING EXEMPTION

A. Public Service Corporation Status

New England Power Company is an "electric company" as defined by G.L. c. 164 and a "public service corporation" as defined by G.L. c. 40A, §3. (Exh. NEP-1; Exh. NEP-1, Att. E). New England Power Company, D.P.U. 92-278/274/280, pp. 2, 18 (1994). See also, New England Power Company, D.P.U. 92-255 at 2(1994). Accordingly, NEP qualifies as a public service corporation for the purposes of G.L. c. 40A, §3.

B. Need for the Requested Exemptions

In its petition, NEP requested exemption from specific provisions of the Haverhill Zoning Bylaw and "from operation of the Zoning Bylaw in connection with its use of the lands...and the construction, use, operation and maintenance thereon of the proposed

substation and the related facilities . . ." (Exh. NEP-1). The exemption is required because the existing use and the proposed expanded use are not permitted uses under the Haverhill Zoning Code. Further, NEP obtained an exemption from the Department for work on the site done a decade ago. (Exh. NEP-1, Att. E).

C. The Record Shows That the Proposed Transmission Project Serves the Public Convenience

The "public convenience" portion of the standard of review in zoning exemption cases encompasses the need for the facility, environmental impacts and alternatives. As noted above, ISO does not address environmental impacts in this brief.⁵

The record clearly shows that reliability of the electric transmission system on the North Shore and beyond depends upon a timely implementation of the Transmission Project. As noted above, the relevant public convenience requires reliability of electric service, which in turn requires new facilities – specifically the Transmission Project. Exh. NEP-JWM, pp. ____; 4-6; Exh. NEP-JWM-4, p. ____; 24; Exh. NEP-JWM-6, p. ____ 20 (RTEP04, p. 262). NEP must comply with various industry standards with respect to the capabilities of its transmission system. *See generally*, Exh. NEP-JWM-3; Exh. NEP-JWM-5. As discussed below, extensive analysis was performed regarding the adequacy

witness Richards stated that: "land use will remain unaffected by this Project...These changes are in keeping with the character of the plot in question." Exh. NEP-FPR, p. —3.

⁵ ISO does observe, however, that where the Transmission Project is located wholly on an existing site (*see* Exh. NEP-KMH 1-R) with limited expansion of that existing site and with fairly limited numbers of neighbors or public frequenting nearby lands, any environmental impact issues should be limited. Indeed, NEP has provided significant evidence to show that those impacts are not unreasonable. For example,

of the transmission system. These analyses show reliability problems in terms of inadequate capacity reserve.

1. Planning Standards

The related transmission system planning standards require that under extreme but reasonably expectable circumstances (*e.g.*, a high load, normal capacity available, and contingency outages with various single elements of the transmission system). In these circumstances transmission system elements must be able to meet their long term emergency rating. ("LTE") Exh NEP-JWM-4, pp. ——2,4,6,7. (NEMA/Boston Planning Study)

To determine what actions were needed to ensure reliability NEP and ISO performed a variety of studies to determine the thermal and voltage performance of the North Shore system, considering different load levels and contingencies. Additionally, NEP and ISO performed an operating reserve capacity analysis. Exh. NEP-JWM-6, p. —pp. 18-19 (RTEP04, pp. 260-261).

2. Thermal and Voltage Performances Require the Ward Hill Upgrade

With respect to the thermal and voltage performance, the study considered the range of transmission interface transmission levels. The load carried over the North Shore transmission facilities (in significant part, the "through flow" to the Boston area) is one major factor affecting the reliability of the system. Next, the Study considered the generation capacity that is normally available and the local load required to be served. Then, a specified range of contingencies was simulated (including failure of various

transmission lines, transformers, breakers etc.). Standard thermal and voltage criteria were applied such that transmission elements would not be required to exceed their short term rating within a 15 minute time interval or their long term rating after the necessary prompt system action is taken beyond the initial 15 minutes post-contingency. The standard for voltages on each transmission system element after the contingency was a 5% deviation for 345 kV and 230kV elements and 10% on 115 kV and 69 kV elements.

Using a DC load flow analysis and assuming an area peak load of 1146 MW [2006 Summer Case] and a 500 MW import limit, NEP and ISO determined that no more than 210 MW of local generation can be out of service without violating first contingency coverage. For example, unavailability of either of Salem units 3 or 4 in such circumstances would cause a transmission overload. Such analysis was confirmed by an AC load flow analysis. NEP's witness described how such overloads could cause service outages.

- Q. What's the projected effect on equipment that's already on the system if we don't make these improvements that are proposed?
- A. The effect of equipment already on the system if we didn't make the Ward Hill improvements as proposed, that equipment would, on contingency, and eventually in a normal operating mode, be subject to loadings beyond their capability, which would lead to exceeding the design life of the equipment, which would stress the equipment beyond what it's capable for. And that would likely lead to equipment failures. That could be a transmission line could get overheated and sag down into a tree, trip out. It could cause a fire. A transformer that would be operated beyond its capability would overheat, could lead to an explosion, massive equipment failure, and outages.
- Q. So is it fair to say that the proposed project would not only serve to meet immediate and future needs, but would also serve to preserve the system as we now have it in place in the region, by protecting existing equipment?

A. By allowing us to continue to operate existing equipment within its ratings, yes. The NEMA/Boston Planning Study analyzed the thermal and voltage performance of the North Shore area. This study discovered that, for stressed system conditions (including high New England North-to-South and high BOSTON Import transfers), the existing Ward Hill 345-115 kV transformer and area 115 kV facilities are subject to post contingency overloads. Additionally, without Salem Harbor generation, voltages do not meet criteria for a significant number of contingencies.

Tr. pp. 84-85.

With these analyses showing which transmission system elements limited reliable service, different system upgrades were simulated to determine whether they would allow the system to comply with planning standards. Exh. NEP-JWM-4, pp. 15, 24. (NEMA/Boston p. 15, 24Planning Study) In this manner, NEP and ISO determined what short term and long term upgrades would maintain system reliability independent of whether Salem Harbor generation is retired or not.

The proposed Transmission Project is a critical component of the identified solutions.

3. Maintaining Operating Reserve Requirements Demand Expeditious Implementation of the Ward Hill Upgrades

In reviewing the transmission system adequacy, NEP and ISO also analyzed operating reserve capacity. The first input was a typical import capability of 600 MW for stressed conditions. Another base assumption was that a normal amount of resources (10 - 60 MW) would not be available. Also, this analysis considered load shedding as a mitigating factor. NEP and ISO then studied the results of several different contingency scenarios. The analysis concluded that for stressed conditions, the North Shore area is already deficient, even with Salem Harbor generation units available. The following

figure shows the extent (in megawatts) of the North Shore Area operating reserve deficiency during the summer period.

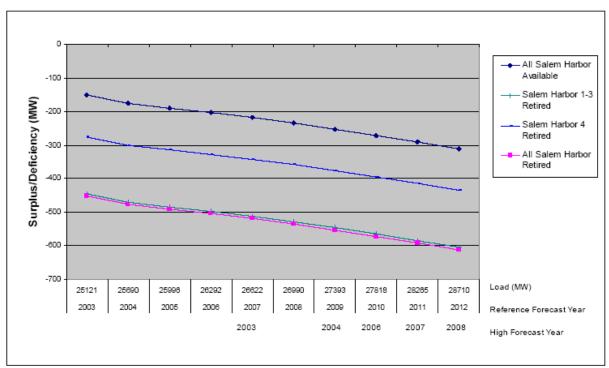


Figure 15.3

North Shore Area Operating Reserve Surplus/Deficiency for Annual Peak Hour (MW)

Table 15.3 also shows the number of megawatt hours (MWh) associated with operating reserve deficiencies during the summer period. These MWh deficiencies are a measure of the integrated number of MWh that Salem Harbor is required to satisfy operating reserve deficiencies during the summer period.

Exh. NEP-JWM-6, p. 19. (RTEP04, p. 261)

In a high forecast year (relatively extreme weather resulting in high loads), the North Shore Operating Reserve deficiency is over 200 MW now, even with Salem Harbor generation in service. Exh. NEP-JMW-6, p. 19 of 22 (RTEP04 p. 261). Even in normal weather and load conditions there is still well over a 100 MW operating reserve deficiency for the North Shore. Installation of the Ward Hill Transmission Project will increase the Operating Reserve by 800 MW. All other things being equal, it can be seen

from the Figure 15.3 above, that such additional capacity will solve the projected operating reserve deficiency through at least 2012 in a normal expectable forecast year and at least 2008 in a forecast year assuming extreme weather in either cause assuming that all Salem Harbor generation is out of service. *Id*.

D. Public Convenience – Summary and Conclusions

Through the thorough analysis summarized above and described in greater detail in Exhibits NEP-JWM; NEP-JWM-4 and NEP-JWM-6, NEP and ISO determined that increasing load on the North Shore and increasing through flow to the Boston area had led to reliability concerns. Specifically, serious voltage concerns are projected to arise in contingency situations by 2006 – the first time the proposed Transmission Project could be put into service after an aggressive construction schedule and prompt approval by the Department and obtaining a limited number of local permits. Tr. 210: 6 – 9. Also, even now the operating reserve is deficient in contingency conditions. These circumstances are only made worse by the unavailability of Salem Harbor generation, which must be considered as a real possibility in light of the yet unresolved request to retire those generating units.⁶

The preferred solution is the proposed Transmission Project. Exh. NEP-JWM, p. 6. Alternatives have been sufficiently considered.

As part of the extensive studies described above, NEP and ISO identified a limited number of alternative system enhancements that could address the identified

maintained.

⁶ The Salem Harbor generating units are the subject of a request to ISO-NE to cease operations, which ISO-NE rejected due to the need for continued operations of such generating facilities to ensure reliability of

electric service. Subsequently, the owner of the Salem Harbor generating units, US Gen New England, Inc. and ISO-NE negotiated a Reliability Agreement to facilitate continued operations of those units. The Reliability Agreement is now before FERC in a contested proceeding. FERC Dkt. No. ER04-841-000. ISO notes these facts as additional support for the determined need for the Ward Hill Transmission Project. As set forth above, the need exists even if all the generation capacity at Salem Harbor is

problems. While the legal standard applicable here does not require proof of the optimal alternatives it is clear that appropriate considerations of alternatives has been made. The range of alternatives is described in Exh. NEP-JWM-6 and ranges from miles of new transmission lines to reconductoring of lines to substation work such as that of the proposed Transmission Project. NEP reasonably chose the proposed Transmission Project over such alternatives because the proposed Transmission Project offers advantages in terms of cost and installation time and had lessinvolves less environmental impact. Exh. NEP-JWM, p. 7; Exh. NEP-JWM-6, p. 20 (RTEP04 p. 262). The Transmission Project, as proposed, is certainly reasonable and NEP has satisfied the showing required regarding public convenience.

V. CONCLUSION

For all the reasons discussed above, the Board should expeditiously grant the zoning exemption for the Ward Hill Transmission Project as proposed by New England Power.

Respectfully submitted

ISO-New England, Inc.

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